



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,261	12/05/2003	Robert R. Rice	NG(ST)7621	1178
26294 7590 01/06/2011 TAROLLI, SUNDHEIM, COVELL & TUMMINO L.L.P. 1300 EAST NINTH STREET, SUITE 1700 CLEVELAND, OH 44114				
EXAMINER VAN ROY, TOD THOMAS				
ART UNIT 2828		PAPER NUMBER		
MAIL DATE 01/06/2011		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/729,261

Applicant(s)

RICE ET AL.

Examiner

TOD T. VAN ROY

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18, 19, 22, 23, 25-27 and 29-31 is/are rejected.
- 7) ☒ Claim(s) 20, 21, 24, 28, 32, 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

The examiner acknowledges the addition of claim 33.

Response to Arguments

Applicant's arguments filed 11/09/2010 have been fully considered but they are not persuasive.

The Applicant has argued Yokokawa fails to disclose that the core regions have more than one dopant each.

The Examiner agrees that this is the case. The Yokokawa reference was interpreted to have a single core with multiple regions as outlined in [0058]. This multi-region core has radially dependent doping using 2 different dopants which independently affect the refractive index and the Raman gain.

The Applicant has argued that the profile shown in fig.4b describes the GeO₂ refractive index profile and not a Raman gain profile.

The Examiner agrees that the refractive index profile is that shown in fig.4b. This profile mirrors the doping profile of the GeO₂, which in turn mirrors the Raman gain profile. As the core is broken into multiple sections with different dopants the change in doping profile and dopant used is found to read on the current claim language by providing independent control between the sections.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 18-19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokokawa et al. (US 2003/0215200) in view of Rice (US 6363087).

With respect to claims 18-19, Yokokawa teaches an optical fiber(fig.4a) comprising: a core having a longitudinal optical axis (fig.4a #111-113) and incorporating radially dependent amounts of dopant material and selected transparent oxides ([0058], creating the refractive index profile seen in fig.4B) that are selected to provide a measure of independent control over both a desired refractive index profile and a desired Raman gain coefficient profile (GeO₂ doping in #111 influences Raman gain, F doping in #112 influences index) that favors lower order modes and discriminates against higher order modes (would inherently allow higher Raman gain along the optical

axis and promote lower order modes and discriminate against higher order modes- due to dopant profile, and after combination with Rice the prior art fiber would have identical properties to the applicant's fiber), the refractive index and Raman gain coefficient have their highest values along the optical axis of the fiber (seen in fig.4b), and a cladding region surrounding the core and having a refractive index different from that of the core material (fig.4b #114), wherein light launched into an end of the fiber is subject to higher Raman gain along the optical axis (due to doping profile), which promotes lower order modes and discriminates against higher order modes. Yokokawa does not teach the fiber to be multimode. Rice teaches a multimode Raman amplifying fiber (abs.) that is formed to allow propagation of lower order modes while discriminating against higher order modes (col.4 lines 20-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the fiber of Yokokawa with the core and cladding sizing of Rice (col.4 lines 14-36) in order to allow for increased amplification of the lowest order mode while enabling efficient pumping via multimode pump sources (col.4 lines 32-36).

With respect to claim 22, Yokokawa and Rice further teach the fiber is configured to provide higher Raman gain along the optical axis (Yokokawa, fig.4b) for multimode light launched into the fiber (Rice, col.4 lines 32-36).

Claims 23, 25, 26 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokokawa and Rice in view of Clarkson (WO 02/50964 A2).

With respect to claim 23, Yokokawa and Rice teach the fiber as outlined in the rejection to claim 18 above, but do not teach a diode laser array providing pump power to the fiber, means for launching the pump power into the fiber, and reflective means defining a laser cavity. Clarkson teaches a fiber laser system (fig.8a) which includes a diode laser array providing pump power to the fiber (fig.8a #13), means for launching the pump power into the fiber (fig.8a #15), and reflective means defining a laser cavity (fig.8a #50, 55). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the fiber of Yokokawa and Rice with the fiber laser system of Clarkson to pump the fiber gain medium and provide feedback allowing for generation of Raman amplification and oscillation of the laser signal for transmission.

With respect to claims 25-26, Yokokawa, Rice and Clarkson teach the fiber laser as outlined in the rejection to claim 6, and Clarkson additionally teaches a highly reflective mirror at one end (fig.8a #50, pg.19 lines 20-25), and a partially transmitting mirror at the other (fig.8a #55, pg.21 lines 18-21), including outputting an essentially collimated beam to the output mirror (pg.21 lines 3-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the fiber laser of Yokokawa, Rice and Clarkson with the mirror reflectivities and lenses of Clarkson in order to allow for the oscillation of a given percentage of the light input into the fiber, to make use of the gain medium, as is well known in the art, as well as to properly spatially position the beam for coupling to any additional optics.

Claim 29 is rejected for the same reasons outlined in the rejection of claim 22 above.

The method of claim 30 is rejected as being taught by Yokokawa, Rice and Clarkson as outlined in the rejection to claim 6.

With respect to claim 31, Yokokawa, Rice and Clarkson teach the fiber laser and method as outlined in the rejection to claims 23 and 30, wherein Rice teaches a multimode input (see claim 18 rejection above).

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokokawa, Rice, Clarkson, and further in view of Paldus et al. (US 2003/0161361).

With respect to claim 27, Yokokawa, Rice and Clarkson teach the fiber laser system as outlined in the rejection to claim 23, including the use of multiple lenses (Clarkson, pg.21 lines 6-7), but do not teach the use of a pinhole filter. Paldus teaches a laser system using a pinhole filter ([0071]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser system of Yokokawa, Rice and Clarkson with the filter of Paldus in order to utilizing a bandpass method to spatially filter the output light.

Allowable Subject Matter

Claims 20, 21, 24, 28, 32 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2828

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tod T Van Roy/
Primary Examiner, Art Unit 2828